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ABSTRACT

As with all new programs, the costs associated with library automation must be carefully considered before implementation. This document suggests guidelines to be followed and areas to be considered in the costing of library procedures. An existing system model has been suggested as a standard (Appendix A) and a classification of library tasks originally devised for the British Library is put forward as a tentative basis for a standard (Appendix B). A check list of cost headings is given in Appendix G. Given a basis such as is provided by these, the costing of manual and automated procedures can proceed. Appendices C-F refer to particular data recording methods. The heads to be considered in costing proposed systems (in particular, automated systems) are covered in some detail, and it is recommended that decisions on implementation of new systems are made only after estimates of costs have been made for a well-defined planning period. An accurate knowledge of costs assists in the decision-making process. Costing is a straightforward exercise when carried out systematically; the difficult task is the allocation of resources. In the university field this includes a long look at the university as a whole, and this work is now beginning to be done. The appendices to this report are intended to give assistance in the analysis of costs and the preparation of budgets. (Author/SJ)

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Library Automation : Guidelines to Costing

Prepared for OSTI

by

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Library Automation : Guidelines to Costing

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PREFACE

In recent years the Office for Scientific and Technical Information (OSTI), Department of Education and Science has awarded several grants, mainly to academic institutions, for the study, development and testing of automated library processes. It is clearly essential that, before any new systems are adopted operationally, rigorous costing studies must be undertaken. Such studies have played an important part in the OSTI-supported projects, and economic appraisals have been made of both the traditional, manual, library methods and new, automated, ones.

Discussions held between OSTI, librarians involved with automation projects, and others, revealed a need for a document which could be used as an introduction to the costing of library procedures, both current and proposed, and which would build on the experience so far gained. OSTI accordingly commissioned this report which is aimed primarily at librarians considering automation.

The views expressed in the report are solely those of the author and do not necessarily represent the views of the Department of Education and Science.

1. Introduction

It is not the purpose of this document to argue the case in favour of costing; it is sufficient to state that a librarian's task is that of managing a library service, and effective management is impossible without an appreciation of the costs involved in providing that service. This document recommends ways of treating particular areas when undertaking costing activity.

It should be stressed that systems analysis and costing are (or should be) continuing activities, rather than ad hoc exercises undertaken only when the question of automation arises. Effective planning is dependent on effective control - which includes budgetary control. I expect in the future more librarians to make a much closer study of the internal operations of their libraries, so that their planning and estimating can be based much more on solid fact and much less on history and precedent. The widespread introduction of Management by Objectives (MbO) in Libraries would seem a logical step (e.g. Bryant, 1971).

An outline of the steps involved in carrying out an automation feasibility study will indicate the points at which cost data are needed.

(1) define problem area

(2) define objectives of the procedures under examination

(3) examine existing procedures in detail

(4) determine levels of activity

(5) devise alternative methods (manual) of achieving same objectives

(6) devise alternative methods (automated) of achieving same objectives

(7) compare operating costs of alternatives with existing procedures

(8) determine development and implementation costs of alternatives

(9) make projections of costs over planning period

(10) make decision

Since libraries are labour intensive - almost all of their operating costs are for personnel* - it is important to be able to determine the amount

* A library's expenditure on books and serials should not be regarded as part of the operating cost, but as capital expenditure.

of labour required to perform each task involved. The degree of detail required will depend on the purpose for which the cost is needed.

One of the major disincentives to costing in university libraries has been the compartmentalization of funds: equipment being paid for separately, capital being effectively free or unavailable, computer time being abundant or non-existent, automation being financed by OSTI, and so on. In this document political considerations are largely ignored - £1 is £1 is £1.

2. Costing Methodology

2.1 The System Model

Before costing activity can take place it is necessary to construct a conceptual model of the system under review. The structure of the model will be influenced by the purpose for which it is designed. The linear programming model developed in Durham (Morley & Ford, 1969) is very different from the cost model used in Birmingham (BLCMP, 1971) although they both describe the activities of university libraries. For an initial approach to costing we require two things - the overall conceptual model, and a list of all the tasks performed in the library. If systems are to be compared, a standard model and a standard task list are required. The BLCMP model already referred to is recommended for the former and is reproduced in Appendix A; for the latter, see Appendix B. The overall model enables us to see each activity in context, while the task list gives us the basic building blocks from which any procedure can be constructed. For convenience the main definitions of the costing model are reproduced here.

Suggested definitions of a library system

Levels

Sub-System: Primary area within a system, not necessarily corresponding to any single traditional library department.

Procedure: The level concerned with information flow. Information movement and processing grouped as consecutive or related activities are identified. The components of processing are functions, elements and steps.

Function: A function is an identifiable activity within processing designated by a verb. Functions must refer to similar levels of activity within a procedure. A function can consist of a single element or a sequence of related elements.

Element: This specifies a discrete part of the processing involved in an individual function. An element can consist of a single step or a sequence of steps. There are two types of element:

1. Elements that do not contain decisions, i.e. sequential steps.
2. Elements which comprise decision(s).

Step: A single action within an element and the smallest part of any processing. It is specified by a statement containing a single verb. Steps can be common to all elements.

For broad comparisons between systems, the PROCEDURE is an appropriate level to consider; more detailed comparisons would be carried out at the FUNCTION level. For comparative purposes the task list is indispensable, since each function will be defined in terms of discrete tasks: a task may be equivalent to a function, an element or a step, depending on the particular method under consideration.

A standard costing formula must also be adopted. The general costing formula is

Total costs = Direct costs + Indirect costs

where each of the components of the right hand side can be further divided into Labour, Materials and Service. A comprehensive list of cost headings will be found in Appendix G. Before looking at these in more detail, we must consider the problem of realism in costing.

2.2 Comparability and Realism

When comparisons are being made, standards have to be adopted - this is why money came into existence. Our first difficulty arises from the fact that there is no standardisation of either grade or salary for the performance of any of the tasks associated with library activity. Although in public and university libraries there are nationally negotiated salary scales, the end points and bars on these scales are locally determined; the qualifications for entry to each grade are variable; and in any case people are different. A professionally qualified graduate in one library might be incapable of, or not trusted with, decisions which elsewhere are the province of an eighteen year old with neither degree nor diploma. Thus it

is essential that any cost analysis should state what grade of staff is allocated to each task; and where cost comparisons have to be made, that a common point on a common salary scale is adopted for each grade. The appropriate point for comparison between systems is the mid-point of the scale. Costs determined in this way must be distinguished from the real costs, which are derived from the actual salaries of the people performing the job under review.

In large libraries it is not surprising that the real costs and the 'standard' costs should be very similar (Smith & Schofield, 1971). This lack of standardisation of task with salary grade suggests that comparisons between manual systems can best be made in terms of time rather than cost. This may reveal differences which demand further investigation. For example, a comparison of catalogue card filing in two libraries showed the following:

	Library A	Library B
Mean time to file 1 card	31 secs.	58 secs.

In Library A, all filing was done by assistant librarians (professionally-qualified graduates); in Library B, filing 'above the rod' was done by junior assistants, and checked by an assistant librarian, the total time being composed of 47 secs. filing and 11 secs. checking. With annual mean salary costs of £2450 for the higher grade and £950 for the lower, simple arithmetic shows that the filing costs of Library B are about 5% less than those of Library A, although the overall filing time is nearly twice as long.

2.3. The Cost of Costing

The detailed analysis of costs in a library system can be a lengthy (and costly) process. This in itself is an argument for establishing cost control as a regular activity. The administrative effectiveness system devised by the Cambridge LMRU (Smith & Schofield, 1971) is a ready-made proven procedure which can do nothing but assist the manager in his continuing task of control. For long-range planning, less detailed data may be required, although the overall performance figures must be soundly based on such data as is provided by the day-to-day information system. The cost-flow accounting

model suggested by Leimkuhler and Cooper (1971) can be used as a fairly simplistic approach to comparing systems, requiring comparatively little data collection. For more detailed analysis, such as the preliminary stages of an automation feasibility study, it may be necessary to undertake special surveys to determine the exact allocation of labour to certain tasks, and the frequency of occurrence of particular activities.

It is now time to consider the components of the costing formula (see 2.2, above) in more detail.

2.4 Direct Labour Costs

Direct labour is the professional and clerical work directly associated with the units of output; that is the labour which processes the books and serials, issues the books, answers the enquiries. In manual systems, this is the major component of the total cost, and it is worth spending some time on the methods available for measuring these costs.

We are here concerned with the application of work measurement and time study to library operations. The particular technique chosen will depend on the specific objectives of the costing exercise, and the nature of the activity under consideration. Ideally, the method of data collection chosen should avoid disturbance of the worker; in practice it is only possible to minimise disturbance rather than to eliminate it completely. Effectively, there is a choice of two techniques - observation, and self-recording - and the technique employed is almost pre-determined by the particular sub-system being studied. Thus, when observation techniques are used, it is essential that the observer should be able to recognise the tasks being done in order to avoid disturbing the worker. In the acquisitions and processing sub-systems, many of the tasks are sedentary and indistinguishable at a distance. Further, the kinds of task performed in these sub-systems extend over a period of time significantly greater than the length of time taken to record the activity - for example, an acquisitions clerk may spend a whole morning sending reminders to booksellers, and it will take less than a minute to record this fact. Obviously self-recording is the best method here. However, in the field of issuing and returning books, the staff employed on these duties frequently act as a pool of labour, with a number of varied duties - filing, shelving, date

stamping, etc. - and the allocation of labour to these duties varies according to the load, which in turn is determined by the random arrival of users to borrow and return books. In these circumstances, where, for example, filing activity may be subject to interruptions to discharge books returned from loan, and the interruptions are random both in occurrence and in duration, independent observation is the only effective method of data recording. A brief outline of the two methods is given below; a more extended treatment will be found in the Final Report of the South West automation feasibility study (SWULSCP, 1973).

2.4.1 Self-recording

This technique is acceptable in a wide variety of library tasks. In essence, members of library staff keep diaries of their activities, recording the time spent on each task and the number of items processed. It is important that there is as little disturbance to normal routine as is possible; it may be desirable to stagger data collection so that at any one time only a selection of tasks is being recorded in order to reduce the effort required of any individual. Wherever possible, 'automatic' recording should be used; for example, if books are accessioned using a running number it is only necessary to record the last number used in each period, and the number of items accessioned will be obtained from this rather than from a solemn item-by-item count. To achieve maximum effectiveness with this method, it is necessary to define in advance the tasks to be recorded by each member of staff, and to provide a standard form on which to record times. A simple coding scheme for the pre-defined tasks will help to minimise time spent on recording, so that exceptional events only will need any significant element of writing. Examples of a code sheet and a completed record sheet (as used by SWULSCP) are given in Appendix C. A variation on this method was employed at Southampton University, where the diary sheets for each day were divided into 5-minute sections. An example of a completed sheet is shown in Appendix D, reproduced from Woods, 1972. The diary technique has also been used by the Birmingham Libraries automation project (BLCMP, 1971), and is broadly similar to the Administrative Effectiveness System already referred to (Smith & Schofield, 1971). Further study of these publications

is to be recommended.

This technique does not yield any true estimate of the 'standard time' for a task; and it is extremely difficult to ensure that all casual interruptions and queries are recorded. It is better to mount a special exercise to assess the nature and duration of such interruptions.

2.4.2 Observation

In cases where the staff carry out large numbers of small, well-defined tasks, it is desirable to use the technique of activity sampling. In this method, a large number of random, instantaneous observations is made, over a period of time, of a group of workers. Each observation records what is happening at that instant, and the percentage of observations recorded for a particular activity is a measure of the proportion of time devoted to that activity. The accuracy of the results can be determined, and any required level of accuracy can be achieved by taking sufficient observations (see Appendix E). As with self-recording, it is advisable to define in advance the tasks which will be recorded: working alongside the staff to be observed is undoubtedly the best way of discovering the main tasks, and incidentally has the advantage of helping to remove workers' resistance to being observed. Inevitably a number of minor tasks not previously noticed will occur during the observation period. An example of a data recording sheet is shown in Appendix F. So far as is known, the only use made of this technique in U.K. libraries has been in Bristol and Exeter universities (SWULSCP, 1973), and in some as yet unpublished studies by Aslib.

Where it has been decided that detailed data on time allocation is necessary for costing purposes, it is therefore recommended that in general self-observation diary techniques be used for the activities of the Acquisitions, Processing and Maintenance sub-systems; and that activity sampling be used for the Use sub-system, and especially for the control procedures (see Appendix A for definitions of these areas).

To establish standard times for particular activities (issuing a book, filing a catalogue card, etc) it may be necessary to carry out stop-watch timings; this is a simple exercise which should require no further elucidation.

2.5 Direct Materials Costs

This covers such items as catalogue cards, order forms and so on. This presents little difficulty in manual systems, and is a comparatively minor cost element; it can become more significant in automated systems.

2.6 Direct Services Costs

Certain items can be regarded as neither labour nor materials. For example, subscriptions to the BNB-MARC service and Books in English are best treated as services to the acquisitions and processing sub-systems. Similarly, subscriptions to computer-based information retrieval and S.D.I. systems such as INSPEC and MEDLARS are services to the use sub-system.

2.7 Indirect Costs

Up till now, the treatment of indirect costs in library cost analysis has been inconsistent. A number of U.S. studies have included storage costs (e.g. Raffel & Shishko, 1969); British studies have ignored all or part of the indirect costs (e.g. Woods, 1972).

To be consistent, it is necessary to include indirect costs, although the relevance of some of these may seem remote. It is impossible, however, to gain a true appreciation of the cost of library provision unless indirect costs are taken into account.

The first area to be considered is the cost of the library administrative sub-system. In one cost models, this cost is apportioned between the other sub-systems on a pro-rata basis: i.e. processing employes 25% of the non-administrative staff and thus 25% of the administrative cost is charged to processing. This is potentially misleading and uneconomic, since there is then little incentive to examine administrative procedures as such. It is preferable to treat administration as a separate sub-system, subject to the same cost analysis as others. Typically, the staff of such a sub-system will include Chief and Deputy Librarians, a co-ordinator of branch and sectional libraries, an administrative assistant, a couple of secretaries and a typist.

The indrect costs to be considered are those of buildings, equipment, heating, lighting, power, telephones, and so on. The basis for allocation of

these indirect costs varies. For example, the cost of heating is divided between the sub-systems on the basis of the cubic metres occupied by them; the cost of telephones is allocated according to the number of 'phones in each section, and so on.

A fairly comprehensive list is given in table 1. Book depreciation may be regarded as the most controversial item; however, it seems logical to treat the library's stock as a capital asset. The cost to be amortized is the cost of the book on the shelf - i.e. the net purchase price plust the cost of processing. The average useful life is assumed to be ten years - that is, the time span over which the book will be used. For certain books and certain libraries the useful life may be much longer or much shorter, but ten years seems a reasonable average for a general library.

Table 1: Annual indirect costs and their distribution to library departments

Costs		Alloc. Basis	Cost Centres				
			Acq.	Proc.	Maint.	Use	Adm.
Depreciation (if not renting)							
Type	life						
Bldg.	40 yr.	sq. m.	x	x	x	x	x
Equip.	5 yr.	% equip.	x	x	x	x	x
Computer	3 yr.	time	x	x	x	x	x
x Books	10 yr.	No. bks.				x	
Jrnals	20 yr.	No. Jns				x	
Repairs & Maint.							
Bldg.		sq. m.	x	x	x	x	x
Equip.		% equip.	x	x	x	x	x
Computer		time	x	x	x	x	x
Files		% files	x	x	x	x	x
Books		No. bks.				x	
Rentals (if renting)							
Bldg.		sq. m.	x	x	x	x	x
Computer		time	x	x	x	x	x
Photo Reproduction Equip.		per page	x	x	x	x	x
Other							
Ins. (Fire, Theft)		sq. m.	x	x	x	x	x
Light		KW hrs.	x	x	x	x	x
Heat		cu. m.	x	x	x	x	x
Water, power		sq. m.	x	x	x	x	x
Telephone		no. phones	x	x	x	x	x

Table 1 (continued)

Costs	Alloc. Basis.	Acq.	Proc.	Maint.	Use	Adm.
Porter; Gdner.	sq. m.	x	x	x	x	x
Adm. Salaries						x
Finance Dept.	% staff	x	x	x	x	x
Misc. Supplies	Dept. use	x	x	x	x	x
Indirect Lab.	Dept. use	x	x	x	x	x
Total Indirect Costs						

Note: These costs should be based on a normal rate of activity.
*The book cost to be amortized is the net purchase price plus the cost of processing the book.

After Brutcher & others, 1964.

In Table 1, the heading 'Adm. salaries' covers the salaries of, for example, a university's Finance department, a proportion of whom will be devoted to paying the salaries of the library staff. An alternative treatment of indirect costs which has been used is to add a fixed percentage of salary costs to cover such items as building, heating and so on. This is a rather simplistic approach and can be misleading, although it has the merit of being easy to calculate.

This section has concentrated on methods of obtaining cost data on existing systems and ways of allocating overheads, with particular reference to manual systems. It is now time to deal with the costing of proposed systems, and in particular, automated procedures.

3. Estimation

3.1 The estimation of costs of proposed systems is fairly straightforward when manual procedures only are being considered. Most, if not all, of the elements of a proposed manual procedure will be analogous to features of existing systems, and it can be assumed that similar tasks will take similar times to complete in both old and new systems. The situation is more complex when automated procedures have to be costed. It can be assumed that the cost of changing from one manual system to another is comparatively small - new stationery is required, but if the changeover is well-timed there will be little waste of old stocks; possibly a new size of filing-drawer will be required. These are negligible compared with the cost of changing over to an automated procedure. It is obvious that, for automation to be worthwhile, it must either reduce the operating cost of the library or provide considerable benefits. There are several factors affecting the cost of automation which need to be considered in detail during the estimation process. Although automation costs are frequently divided into development costs and operating costs, it is not always easy to separate them in practice. In particular the lack of historical data on the costs of designing and programming systems is a grave drawback. It is recommended that in future careful records should be kept of the time spent on these activities, so that cost estimates can be based on the fullest possible information. It is clear that design and programming costs are high; and any possible reduction of costs, either by co-operation at the design stage or by taking over existing systems, should be explored as fully as possible.

We can now consider the major cost factors in automated systems, paying some attention to the other problems raised at each stage.

3.2 Design

Strictly, design includes both the analysis of the existing system and the development of the new. Moreover, it does not cease with the implementation of a new system, since monitoring of system performance and system modification are continous processes, particularly with machine systems. It is necessary for a preliminary design to be worked out before cost estimates

can be made, since the basic concept can have a considerable influence on the cost. Such factors as the source of computer power, the forms of input and output, and the costs of conversion of files can be significant items, and are dealt with separately.

3.3 Machines

It may seem obvious to state that the machine system should be that most suited to the task in hand; but it is often true that, particularly in libraries, the procedures are designed to fit a machine which it is convenient to use, such as a computer owned by the organisation of which the library forms a part. In such cases, the computer time may be 'free' in the sense that the library is not charged for the time it uses; however, the time should be costed and included in the calculations. Since there is no standard way of charging, the machine cost estimates should always include a description of the machine configuration, and the estimated computer running times. There are considerable potential difficulties attached to the idea of using a computer not under the library's control; it is outside the scope of this document to consider them in detail, but reference should be made to the paper by Auld (1969).

Manual procedures, generally speaking, increase in total cost as the level of activity rises. This is not necessarily the case with machine systems. It costs no more in programming time for example whatever the level of activity. It is important, however, that the machines should be capable of taking increased loads, or of being expanded to cope with increased loads when necessary. This may well be a convincing argument in favour of libraries acquiring their owncomputers. Instead of budgeting for an increasing computing cost each year, as would be the situation when using someone else's machine, it becomes a case of having a machine under one's own control, with all the benefits accruing therefrom, possibly at no greater overall cost than the alternative system. This is the approach adopted in the South West (SWULSCP, 1973). An alternative is for the library to share a machine with another department requiring similar facilities, as in Southampton University. The important thing is that the

library should continue to provide its users with the same (or a higher) level of service as it did with the manual system.

3.4 Programming

Like system design, programming is a continuous process. Although the major programming cost is incurred when the program is first written, modification continues throughout the life of a system. Programming falls into three overlapping phases: design, writing, and testing, the last of these being the most expensive. Considerable computer and programming time is involved in correcting errors and resolving problems in order to make programs operational. The machine costs may be affected by the programming language chosen. High level languages (COBOL, FORTRAN, PL/1) are easier to write and test, while being less efficient in terms of computer time than machine languages (PLAN, ASSEMBLER). As a general rule, machine languages take about three times as long to write, and the time saved in computer processing under operational conditions may not justify the additional effort required. However, when machine capacity is restricted, the only solution may be to adopt the low level language. This is likely to be the case where a library purchases a small computer for its own use. Since re-programming for a new machine is as expensive as the initial programming, it is important to ensure that the machine capacity is capable of being expanded when required. When considering the interlinked problems of machine and programming languages, the proposed length of the system life is important: the nature of a library's requirements do not change appreciably over a period of ten years, but the scale of operation may vary considerably. It seems logical to allow for a system life of ten years and to plan the machine capacity accordingly.

3.5 Materials

The problem of materials in automated systems is often overlooked. In batch-processing type operations, where periodic printouts are required, paper alone represents a considerable outlay. Preliminary systems design must therefore include consideration of the size of files,

and the frequency with which supplements and cumulations of printouts are required. The cost of producing printouts of circulation files may be so great that an on-line system may be justified on these grounds alone.* Thus in estimating costs of materials the nature of input and output procedures is an important consideration.

3.6 Input and Output

As indicated above, the operating cost of a system can be markedly affected by the design of input and output procedures. It is a mistake to tailor the input procedure too closely to the machine requirements, as for example by using grid-type worksheets in acquisition and cataloguing systems. The optimum solution is to use simple worksheets with variable length coding fields, and to use library clerks to keypunch the data.

Output procedures have been referred to above; thought must also be given to whether upper and lower case printers are needed, say in cataloguing systems, as these operate comparatively slowly and thus cost more.

3.7 Conversion Costs

When a manual system is replaced with a machine system, data files have to be converted into machine-readable form. The cost will depend on the nature of the file - thus acquisitions files purge themselves naturally, so the cost of conversion may be low; but the conversion of a catalogue requires considerable thought. In addition to keypunching, there may be need for much editing of the data (Bryant & others, 1972; Jeffreys and others, 1971). The decision to close an existing catalogue and to start afresh with an automated procedure implies a certain loss of convenience to the user. A recent survey gives the costs of some alternatives in this situation (French, 1971). The cost of converting to a new circulation system is minimised if book cards, say, are produced only for the active stock of the library (e.g. McDowell & others, 1970.)

* On-line systems in libraries are likely to require dedicated computers (the difficulties associated with using other people's computers seem insuperable - see e.g. SWULSCP, 1973).

3.8 Implementation Costs

When a new system is introduced, there will be a period when additional costs are involved. A trial period is needed when procedural modifications may be made, personnel must be retrained, and new staff manuals prepared.

3.9 Personnel

New machine systems may require new personnel. In addition to retraining existing staff it may be necessary to employ people with new skills, at higher salaries. Established employees may not wish to acquire new skills - it would be unjust to expect a copy typist to operate a tape-typewriter, and this is just the kind of change which may be required by the introduction of a machine system. Also, of course, there will be a continuing need for systems design and programming staff, although the numbers of these will be lower once systems are implemented.

3.10 Building

On occasion, a new system will require alterations to existing buildings - a new issue counter for example. A large computer requires air-conditioning, although it would be unusual for a library in the U.K. to acquire such a machine. In general, small computers do not require air-conditioning, although a limited degree of environmental control is necessary when magnetic tape units are used.

3.11 The wide variety of factors influencing the cost of automation can make it difficult to lay down precise guidelines for procedure. The items discussed above can be summarized as follows:

1. Design - a continuing commitment, but at a lower level after implementation.

2. Machines - a continuing commitment, increasing as the level of operation increases when outside computers are used; a continuing commitment, remaining at same cost level (until the capacity of the system is outpaced) when in-house machines are used.

3. Programming - a continuous commitment, but at a lower level after implementation.

4. Materials - a continuing commitment, increasing as the level of operation increases. Can be reduced by adopting on-line mode of operation, but this is likely to require an in-house computer.

5. Input and output - with off-line systems, input cost varies with level of operation; output depends on size of files, frequency of updating, and pattern of cumulations and supplements. With on-line systems, output costs can be considerably lower.

6. Conversion - varies with the size and nature of the data files to be converted.

7. Implementation - once-for-all cost, dependent on the quality of the design and programming stages.

8. Personnel - apart from the design and programming staff, the personnel costs may decrease, particularly in circulation and cataloguing systems. Some clerical staff may require higher salaries due to higher level of skills attained.

9. Building - dependent on the machine requirements. Minor reconstruction costs only are likely.

3.12 Some examples of costing have been referred to above, and can conveniently be gathered here:

Circulation - automated - operating costs at Southampton University (McDowell & others, 1970).

Cataloguing - manual & automated - operating costs at Southampton University (Woods, 1972)

Cataloguing - manual and automated - operating costs at Birmingham (BLCMP, 1971)

Cataloguing - conversion costs at Birmingham (French, 1971)

Cataloguing - conversion costs at Bath (Bryant & others, 1972)

Cataloguing - conversion costs at Newcastle (Jeffreys & others, 1971).

Acquisitions, Cataloguing & Circulation - manual - operating costs in Bath, Bristol, Cardiff and Exeter Universities (SWULSCP, 1973 - also includes estimates of development and operating costs for automated systems).

The difficulties of distinguishing between development and operating costs, and the need to be able to predict future levels of activity suggest that it is unwise to attempt to make cost comparisons at a single point in time. Rather, when estimating costs of new systems, the planner should take a period of time - say 5 or 10 years - and calculate the likely expenditure during that period using existing systems, alternative manual procedures, and automated systems. It is almost certain that automated systems will cost more in the early part of the planning period, since systems development must proceed before implementation can take place; the net effect, however, may well be an overall reduction in cost. An example of this approach will be found in a report already referred to (SWULSCP, 1973).

4. Concluding Remarks

This document suggests guidelines to be followed and areas to be considered in the costing of library procedures, and some samples of costing in practice have been recommended for further reading. An existing system model has been suggested as a standard (Appendix A) and a classification of library tasks originally devised for the British Library is put forward as a tentative basis for a standard (Appendix B). A check list of cost headings is given in Appendix G. Given a basis such as is provided by these, the costing of manual and automated procedures can proceed. Appendices C - F refer to particular data recording methods. The heads to be considered in costing proposed systems (in particular, automated systems) are covered in some detail, and it is recommended that decisions on implementation of new systems are made only after estimates of costs have been made for a well-defined planning period - say 5 or 10 years. The principle of Discounted Cash Flow can well be applied to such decisions - this technique is not dealt with in the report as it deserves more extended treatment than I can give it(see for example, Duchesne, 1973., which also deals with the wider question of budget

An accurate knowledge of costs assists in the decision-making process. I have not discussed the costing of users' time; while it is comparatively straightforward to discover how much of a user's time is saved by changing the loan procedure, the value to be placed on that time is a debatable point. Economists are used to this problem, and cost-benefit analyses of education usually tackle the problem of the value of education in terms of benefits foregone (e.g. Smith, 1970). A recent application in the (U.S.) library field may prove interesting (Newhouse & Alexander, 1972)

Costing is a straightforward exercise when carried out systematically; the difficult task is the allocation of resources. In the university field this includes a long look at the university as a whole, and this work is now beginning to be done (e.g. Falcon, 1971).

Notes on Appendices

The appendices are intended to give assistance in the analysis of costs and the preparation of budgets.

Appendix A is a model of a library system which gives a structure for process costing. It defines in broad terms the activities which should be considered when costing the library procedures.

Appendix B provides a list of library processes and a coding scheme for use when recording and analyzing data on library operations.

The process of data collection involves the use of forms - for self-recording or for observation. Four examples of self-recording forms are given:

Appendix C: South West University Libraries
Appendix D.1: Southampton University Library
Appendix D.2: British Library
Appendix D.4: Cambridge Library Management Research Unit.

For economy of effort, the most frequently performed tasks are pre-coded, and details of only 'uncommon' tasks would be entered. This means that each worker requires a code sheet - preferably personalised - as is shown in Appendix C. It should be noted that the Southampton form yields less precise data in that the day is divided into 15minute blocks, whereas the other forms allow precise specification of time spent on each activity. Also the Cambridge form is an "exceptions only" form - tasks normally performed being allowed for elsewhere in that particular data recording system.

Appendix F shows a data recording sheet used when observations of activity are made.

For detailed analysis, data collected by self-recording or by observation is collated by one means or another. A detailed coding system (as given in Appendix B) can then be used. In large systems it may be desirable to analyse data by computer, and Appendix D.3 shows a form developed by the British Library which can be used as a coding form for input to a machine system. The sequence is thus :

1. Record data (forms C, D.1, D.2, D4)
2. Code Data (using Appendix B)
3. Transcribe coded data (form D.3)
4. Keyboard data for computer input.

Appendix G gives a suitable list of headings for consideration when presenting a budget. For the allocation of expenditure under each heading to various library procedures, see the body of this report.

BIRMINGHAM LIBRARIES CO-OPERATIVE MECHANISATION PROJECT

Suggested Definitions of a Library System

A. LEVELS

SUB-SYSTEM: Primary area within a system, not necessarily corresponding to any single traditional library department.

PROCEDURE : The level concerned with information flow. Information movement and processing grouped as consecutive or related activities are identified. The components of processing are functions, elements and steps.

FUNCTION : A function is an identifiable activity within processing designated by a verb. Functions must refer to similar levels of activity within a procedure. A function can consist of a single element or a sequence of related elements.

ELEMENT : This specifies a discrete part of the processing involved in an individual function. An element can consist of a single or sequence of steps. There are two types of element:

1. Elements that do not contain decisions, i.e. sequential steps.
2. Elements which comprise decision(s).

STEP : A single action within an element and the smallest part of any processing. It is specified by a statement containing a single verb. Steps can be common to all elements

B. THE LIBRARY SYSTEM

SUB-SYSTEM	PROCEDURES	FUNCTIONS
ACQUIRE: The total acquisition system covering the initiation, checking, effecting, receipt and clearing of orders for items added to the library's holdings.	SELECT: The stage relating to suggestion and initiation of orders.	ORIGINATE: The source and initiation of an order. CHECK: The check on a suggestion for the presence of existing records for the same item in the library files, and for the correct publishing details. TRANSCRIBE: The transcription of suggestion details into standard form.

SUB-SYSTEM	PROCEDURES	FUNCTIONS
	ORDER: The activities producing and despatching orders and of maintaining a record of them.	PRODUCE: Production of the library's standard order form, its checking and confirmation. DESPATCH: Despatch of the order. FILE: Filing of a copy of the order and related records.
	RECEIVE: Report on orders placed, arrival of items and checking.	UNPACK: Dealing with correspondence; opening of parcels and batching of items. CHECK: Check of items received against the order file, any annotation; check on physical condition of items received, together with fund and financial accounting.
PROCESSING: The area of work following the receipt of items to produce bibliographic records for incorporation into the library's files and to release items for preparation.	INPUT: Initial incorporation of an item into the library stock.	ACCESSION: Process of incorporating items into library stock. ALLOCATE: Placing of items for processing, batching and streaming.
	PROCESS: The creation of bibliographic records and their replication.	CATALOGUE: Provisional choice of heading and entry; check to establish these; writing out bibliographic record in standard form which is then checked. CLASSIFY: Establishment of subject content; check of schedules and previous use of classmark or subject term: adding of classmark and library location on standard catalogue form.

SUB-SYSTEM	PROCEDURES	FUNCTIONS
		REPRODUCE ENTRY: The generation of records for incorporation into the library's files.
	OUTPUT: The stage of releasing the items and bibliographic records.	DISTRIBUTE: The placing of items for preparation. FILE: The batching and filing of records for the library's files.
USE: The area of actual library service to users, being the regulation of stock, the enquiry services, other services and library-user education.	SEARCH: The process for satisfaction of customer enquiries other than those classified under INFORM.	RESOLVE INTERNAL: Dealing with customer enquiries by using internal facilities. RESOLVE EXTERNAL: Dealing with customer enquiries by means of external facilities.
	CONTROL: The constraints governing the use of stock.	CONTROL ACCESS: Regulation of the use of stock and registration of user categories. ISSUE: Provision of facility for borrowing and reserving items.
	REPRODUCE: The provision of facilities for use of alternatives to the traditional physical stock of the library and provision of appliances for their use.	PROVIDE PHOTO-SERVICES: Provision of equipment to copy library and other materials. PROVIDE NON-BOOK EQUIVALENT: Provision of appliances.
	INFORM: Information and training in the use of the library.	LECTURE: Tours, instruction and answer to enquiries about use of library. PROVIDE LITERATURE: Written guides to the use of the library. DISSEMINATE: Information service, bulletins, bibliographic services, abstracting service. etc.

SUB-SYSTEM	PROCEDURES	FUNCTIONS
MAINTENANCE: The area of service in the physical sense, being the stock on the shelves, the upkeeping of records and control of the environment.	STOCK: The physical make-ready and repairs to items; review of stock and shelf supervision.	PREPARE: Preparation for shelving and use. BIND: Bind and repair. UPDATE: Review of stock use and of the condition of stock. SHELVE: Shelf supervision.
	CATALOGUE: Revision and physical maintenance of the catalogue file.	REVISE: Correction of entries, withdrawal. MAINTAIN: Replacement of worn cards, alteration of cabinet guides etc.
	ENVIRONMENT: The maintenance of the fabric and equipment.	CLEAN: Dusting, polishing etc. EQUIP: Lights, machinery etc. FURNISH: Tables, shelving cabinets etc. CONTROL: Temperature, humidity, heating, etc.
ADMINISTRATION: The notional area of service to the library that enables the other sub-systems to operate.	SERVICES: Operational services.	PROVIDE { SECRETARIAL / CLERICAL / PORTERAGE } SERVICE
	MANAGEMENT: Planning and control of the library sub-systems.	PLAN: Research & development; services development, etc. CONTROL: Personnel, staffing, accounting, etc. TRAIN: Training staff, Library School students, etc. LIAISE: Relations with larger entity - university, corporation, etc.

D. BUCKLE (BU)
J. HADLOW (AU)
A.R. HALL (PROJECT)
S.W. MASSIL (BU)
R. WALL (BPL)

January, 1971.

APPENDIX B

List of Library Operations/Processes

A universal task list covering all possible activities in all libraries would be an encyclopaedic work. It would be an advantage to have a general list which can be applied widely. A number of operations are widespread in libraries - the two main activities seem to be transcription of information and filing - and this leads to the notion of a faceted classification scheme for library processes. The most comprehensive one (to my knowledge) is that developed by the British Library Planning Secretariat, and their schedules are reproduced here with only very slight revisions. The fourth facet used by the BLPS has been dropped.

The schedules analyse the operations of a library in terms of three facets:

(i) ACTIONS

(ii) STOCK

(iii) THINGS, OBJECTS, SYSTEMS, etc.

An operation can be defined by using a combination of one or more facets from the schedules but an entry must always be made under the first facet of 'ACTIONS'. Listed beside each term in the schedules is a code for that term. A process code can therefore be provided for any operation by selecting the appropriate codes and placing them in the correct order. Operations are generally studied on a departmental or sectional level and the analysis is carried out on a departmental or sectional basis so that all process codes are presented in the context of the department or section concerned.

The process code is made up of a 10 character code of which:

characters 1 to 6 are provided for ACTION codes (either a single action code may be used or any two actions may be combined in numerical order),

characters 7 to 8 are provided for a STOCK code if it is required,

characters 9 to 10 are provided for the third facet of THINGS, OBJECTS, SYSTEMS.

A few simple examples will illustrate how the process codes can be built up.

Operation or Process	Process Code		
Facet	I	II	III
Sorting catalogue cards	066		AF
Typing orders	268		NK
Sending Telex message	268		DH
Checking catalogue card filing	055204		AF
Counting catalogue cards	230		AF
Checking stencils	204		AL
Revision of cataloguing	026202		
Preparation of readers' guides	112		BG
Training new cataloguers	026254		
Recording periodicals arrivals in Roneodex	017	04	GA

Classification of Library Operations/Processes

I	ACTIONS: Any two actions may be combined in numerical order
001	Acquisitions work
002	Selection
003	Ordering
004	Checking and hastening
005	Purchasing
006	Exchange
007	Receipting
015	Item streaming
016	Stamping
017	Recording/registration
018	Precataloguing
025	Cataloguing and subject work
026	Cataloguing
027	Author/title cataloguing
028	Description
029	Selective cataloguing
030	Cataloguing by alteration
035	Subject work
036	Subject analysis/Indexing
037	Subject synthesis
038	Classification
039	Verbal systems
040	Services to cataloguing and subject work (Clerical support)
041	Placing and pressmarking
042	Placing
043	Pressmarking
045	Proofreading
046	Editorial work
047	Catalogue production

049	Binding
050	Rebinding
051	Binding control
052	Labelling
053	Boxing (Preparation of boxes for periodicals)
055	Filing (includes shelving)
056	Refiling (includes reshelving)
058	Maintenance
060	Replacement
061	Conservation
062	Repairing
064	Separating
066	Sorting
068	Listing (Manual)
070	Discarding
072	Disposal
074	Stock editing
080	Public services/Reader services
081	Location and retrieval
082	Reception/Screening
084	Borrowing
086	Returning
088	Lending
089	Issuing

091	Enquiry services
092	Research
095	Fetching/Picking
097	Searching and troubleshooting
099	Transmission
100	Transporting
101	Delivery
104	Storage
106	Translating
108	Educational services (Organisation and conduct of courses, meetings, visits, etc.)
110	Co-operation
112	Preparation
114	Advice
166	Designing
118	Publishing
120	Printing
124	Sales promotion
126	Handling
128	Packing
130	Loading/Unloading
132	Distribution

134	Postage/Despatch (Includes weighing/franking, etc.)
136	Union/Staff association work
138	Cleaning
140	First aid
150	Photographic work
152	Photographic work control
154	Photographic queries
160	Photocopying
166	Microphotocopying
172	Replication (duplication)
200	Tagging and coding
202	Authority checking
204	Checking
206	Revision
208	Final revision
210	Amendment/correction/conversion
220	Administration
222	Planning
224	Research and development
226	Management information
228	Accounts work
230	Statistics
232	Budgeting

234	Costing
236	Data processing
238	Programming
240	Systems analysis
242	Systems maintenance
244	Secretarial services
246	Personal services
248	Services to committees
250	Training
252	Learning
254	Teaching
256	Documentation
258	Punching (Cards)
260	Tabulating (Machine)
262	Correspondence (Writing, etc. of letters, etc.)
263	Drafting (Replies, reports, etc.)
264	Writing
266	Dictating
267	Receiving dictation
268	Keyboarding/Typing
270	Meetings (Attendance at)
272	Discussions (Informal, internal meetings)
280	Telephoning
282	Answering the telephone

300	Supervision
304	Recording (Keeping records, ledgers, etc.)
308	Messenger services
312	Security duties

990	Time lost
991	Annual leave
992	Sick leave
993	Time off in lieu
994	Travelling time
995	Miscellaneous time off
996	Study leave

II STOCK

01	Publications (in general)
02	Monographs
03	Pamphlets
04	Periodicals
05	Newspapers
06	Trade Literature
07	Single sheet material
08	Cards (e.g. Abstracts on cards)
09	Patents
10	Maps
11	Music (Printed music)
12	Manuscripts.

31	Non-book media
32	Recordings on disc
33	Films
34	Microforms
35	Microfilm
36	Microfiche
37	Microcard
38	Recordings on tape
39	Cassette recordings
40	Photographs
41	Slides

III THINGS, OBJECTS, SYSTEMS, ETC:

AA	Ideas (Information, knowledge, data)
AB	Compilations of information
AC	Records (of stock, etc.) see also EC-EF
AD	Catalogues
AE	Catalogue entries
AF	Catalogue cards (slips)
AG	Cataloguing slips (Accession sheets)
AH	Shelflists
AJ	Authorities (records of cataloguing, etc., decisions)
AK	Departmental archives
AL	Master stencils
BA	Publications (in general)
BB	Reference tools
BC	Bibliographies, reading lists
BD	Abstracts
BE	Manuals
BF	Thesauri
BG	Teaching aids
BH	Aids to readers
CA	Buildings
CB	Public rooms
CC	Reading rooms
CD	Staff rooms/Mess rooms
CE	Workrooms
CF	Bookstacks
CG	Outhousing
CH	Libraries other than home library

DA	Machines (in general)
DB	Typewriters (normal - manual or electric)
DC	Varitypers
DD	Dictating machines
DE	Punched tape typewriters
DF	Replicators
DG	Collators (for collecting sets of sheets)
DH	Telex
DJ	Tele-facsimile machines
DK	Key punches
DL	Verifiers
DM	Reproducers
DN	Sorters
DP	Collators
DQ	Tabulators
DR	Calculating machines

EA	Computers and ancilliaries
EB	Central processing unit
EC	Punched cards
ED	Punched tape
EF	Magnetic tape
EG	Discs
EH	Computer print-out
EJ	Tele terminals
EK	Visual display units

FA	Photocopying machines
FB	Cameras, general
FC	Microfilm cameras
FD	Developers
FE	Fixers

FF	Dryers
FG	Enlargers
FH	Printers
FJ	Splicers
FK	Graders
FL	Dry copiers (Xerox etc.)
FM	Microfilm reader/printer
FN	Microfiche/card reader/printer
FP	Ultrafiche (PCMI) reader

GA	Kardex/Roneodex cabinets
GB	Kardveyors
GC	Other mechanical record holders
GD	Addressing machines
GE	Collating machines (for comparing documents)
GF	Stamping machines
GG	Labelling machines
GH	Solander boxes
GJ	Binding blocks
GK	Shelf boards

HA	Stationery

JA	Classification schemes (in general)
JB	Dewey
JC	Library of Congress
JD	U.D.C.
JE	British Catalogue of Music
JF	POL
JG	SRL
JH	Local Placing systems

KA	Verbal subject systems (in general)
KB	Library of Congress subject headings
KC	Precis
KD	Local Subject index
LA	Cataloguing rules (in general)
LB	AACR
LC	BM
LD	ISBD
LE	ISBD (S)
LP	Standard numbering systems (in general)
LQ	ISBN
LR	ISSN
MA	Exhibitions
NA	Payments (in general)
NB	Payments - outwards
NC	Payments - inwards
NM	Timesheets
ND	National insurance
NE	Tax
NF	Superannuation
NL	Salaries
NG	VAT business
NH	Petty cash
NJ	Contracts
NK	Orders
NN	Correspondence
NP	Mail
NQ	Subscriptions

PA	Applications (for publications)
PB	Reservations (for publications)
PC	Readers tickets
QA	People (in general)
QB	Staff
QC	Readers
QD	Visitors (to members of staff)
QE	Other public
RA	Furniture
SA	Vehicles/Mechanical handling equipment
SB	Trolleys
SC	Vans
ZA	Waste
ZB	Waste Paper

APPENDIX C

Code sheet for self observation

Completed diary form

(As used by the South West University Libraries Systems Co-operation Project)

PENNY

P1*	Checking requests with on/order file
P2	Typing orders and entering in order book
P4	Posting orders
P5	Filing order slips/request slips
P6	Unpacking books
P7*	Checking books with invoices and adding date etc. to flimsy and hard card
P9*	Extracting hard cards and sending flimsies to departments
P10	Entering invoices in ledger
P11*	Chasers
P12*	Reports from booksellers
P13	Stationery supplies
M2	Re-shelving
L	Coffee, lunch, etc.

* Please count the number of books or slips dealt with.

DATE 3/3/70

NAME Penny

DEPARTMENT Acquisitions

CODE	DESCRIPTION (where not coded or code inadequate)	Start	Finish	No.
M2		9 00	9 55	
P13		9 55	10.10	
N1		10.10	11.05	
L		11.05	11.20	
M7		11.20	11.40	
N5		11.40	11 50	
P2		11 50	1 00	
L		1.00	2 00	
P7		2 00	2.40	30
P2		2 40	2.45	
	Ext. no. of reminders sent	2 45	3 05	
P12		3 05	3 25	18
P11	Lag no. due to problem sorting out of reminders	3 25	4.05	13
L		4.05	4.20	
P11		4.20	5 00	23
	Sum.			

APPENDIX D

1. Completed diary form
   (As used by Southampton University Library)

2 & 3. Diary forms
   (As used by the British Library)

4. Diary form
   (As used by the Cambridge Library Management Research Unit)

NAME SENIOR LIBRARY ASSISTANT DATE Sheet No.11

MORNING			AFTERNOON			EVENING	
	Codes	Totals		Codes	Totals		
9.15	62 65 37	4	13.15	00		17.15	99
9.30	99		13.30	00		17.30	
9.45	31 29	6	13.45	00		17.45	
10.00	31 29		14.00	99		18.00	
10.15	31 29	2	14.15	99		18.15	
10.30	22 99		14.30	99		18.30	
10.45	00		14.45	27		18.45	
11.00	32 29		15.00	27		19.00	
11.15	32 29		15.15	22		19.15	
11.30	32 29		15.30	27		19.30	
11.45	99		15.45	00 27		19.45	
12.00	99		16.00	61 91 92 93	11 11 6 5	20.00	
12.15	99		16.15			20.15	
12.30	32 29		16.30	27		20.30	
12.45	32 29	14	16.45	61 91 92 93 62	3 3 1 2	20.45	
13.00	00		17.00	62 65		21.00	
Totals for Day						21.15	

CODE	TOTAL	CODE	TOTAL
00	80	62	15
99	110	65	10
27	70	37	5/4
		31	15/8
29	60	22	20
32	35/14	61	15/14
91	15/14	92	15/7
93	15/7		

21.30	
21.45	
22.00	

INSTITUTION . . . . . .

SECTION . . . . . .

NAME & INITIALS . . . . . .

GRADE . . . . . .

WEEK NO. . . . . .

DAY . . . . . DATE . . . . . .

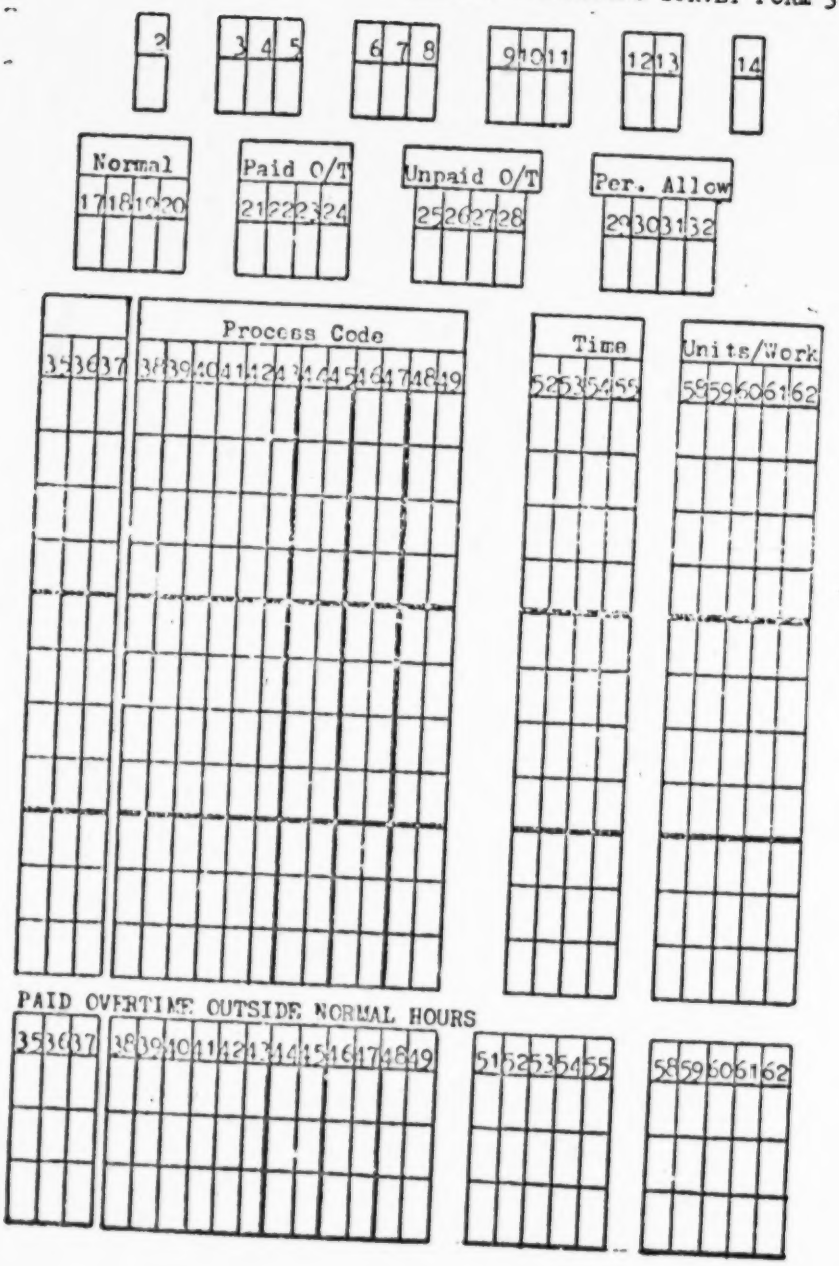
NORMAL HOURS OF WORK TODAY: ..... Hrs. .....Mins.

TIME WORKED OUTSIDE NORMAL HOURS: 1. PAID OVERTIME ..... Hrs. .....Mins.

2. UNPAID/VOLUNTARY OVERTIME ..... Hrs. .....Mins.

DETAILS OF PROCESS/TIME OFF	TIME SPENT Hrs.	Mins	UNITS OF WORK COMPLETED
PAID OVERTIME OUTSIDE NORMAL HOURS			

LIBRARY OPERATIONS SURVEY FORM 3



LIBRARY MANAGEMENT UNIT INFORMATION SYSTEM

NAME: _____ LIBRARY: _____

PERIOD FROM _____ TO _____ GRADE: _____

Please record details of all tasks carried out except those of _____. If the process is in connection with periodicals prefix data with 'P'. In addition please record leave, sickness, compensatory time off etc.

DATE	DETAILS	UNITS	HRS.MINS.

DATE	DETAILS	UNITS	HRS.MIN

TIME WORKED OUTSIDE NORMAL HOURS

DATE	DETAILS	UNITS	HRS.MINS

APPENDIX E

Activity Sampling Formulae

There are two formulae which should be known by all investigators using the Activity Sampling technique. The purposes of the formulae are to determine:

a) the possible error in the result obtained by Activity Sampling

b) the size of the sample which should be taken to bring the result within the accuracy required.

In all sampling, there is bound to be some error between the data obtained by the sample and the facts. The larger the sample, i.e. the greater the number of observations, the nearer the data will be to presenting a true picture of the facts. The possible error in the figures obtained is calculated according to the following formula.

$$L = \pm 2\sqrt{\frac{p(100 - p)}{N}}$$

where L = the limits of variation (stated with 95% confidence) expressed as a percentage of the total time.

p = percentage of total observations spent on a particular activity.

N = total number of random observations.

For example in an office problem where 56% of the clerks' time is spent on Clerical Work.

Using the formula $L = \pm 2\sqrt{\frac{p(100 - p)}{N}}$

where $p = 56\%$

$N = 4500$

then $L = 2\sqrt{\frac{56(100 - 56)}{4500}}$

$= 2\sqrt{\frac{2464}{4500}}$

$= 2\sqrt{0.5475}$

$= 2 \times 0.74$

$= 1.48$ (say 1.5)

Therefore, it can be stated within 95% confidence limits(95 times out of 100) that the average time spent by the clerks on Clerical Work lies within the limits 56 $\pm$ 1.5 per cent, i.e. within the limits 54.5% to 57.5%.

If it is required to bring the accuracy within finer limits, say $\pm$ 1% then the following formula is used to determine the number of observations.

$$N = \frac{4p(100 - p)}{L^2}$$

where N = Number of observations required

p = percentage of total observations spent on a particular activity

L = the limits of permitted variation stated as a percentage of the total time.

$$N = \frac{4 \times 56 (100 - 56)}{1 \times 1}$$

$$= 4 \times 56 \times 44$$

$$= 9856$$

Therefore to be able to state within 95 per cent confidence limits that the average time spent by the clerks on Clerical Work lies within the limits 56 $\pm$ 1)%, or 55% to 57% it is necessary to make 9824 observations.

APPENDIX F

Activity sampling record sheet

(As used by the South West University Libraries Systems Co-operation Project)

DAY _____ DATE _____ PERIOD _____

Time	Description	Tally	Total	%	Total prior
	WRITING POST CARDS.	~~HHT~~ II	8		
	CATALOGUE N.C.L.	1	3		
	S/C				
	T.C.	II	2		
	Helping Waller	III	3		
	QUERIES. User	~~HHT~~ ~~HHT~~ ~~HHT~~ III	18		
	Library with Counter staff	~~HHT~~ ~~HHT~~ II	12		
	with Other staff	III	3		
	ADMIN Building	I	1		
	Timetable				
	Correspondence.	II	2		
	TELEPHONE Internal	~~HHT~~ ~~HHT~~ I	11		
	External	II	2		
	SORTING BOOKS	~~HHT~~ ~~HHT~~ II	12		
	MAKING TEA				
	L - Lunch, loo etc.	~~HHT~~ ~~HHT~~ ~~HHT~~	15		
	SEARCHING SHELVES	IIII	3		
	FILE REFERENCE	I	1		
	IDLE TIME.	~~HHT~~ ~~HHT~~ ~~HHT~~ III	19		

APPENDIX G

Expenditure and Revenue Headings

This checklist of cost headings has been prepared by the British Library (one of their headings has been omitted as it is of only local significa It shows the headings which will be of use in preparing a library budget. On a point of detail, it can be argued that conceptually "Purchase of Books and Periodicals" is a sub-heading of "Capital Expenditure" and that "Binding of Library Stock" is a sub-division of "Running Expenses." This view is useful when thinking about the library, although it may be undesirable to introduce it in the presentation of budgets to the source of library finance. This latter activity is so dependent on the politics of the local situation that it cannot be dealt with here.

For convenience, the British Library Codes are given with the suggested cost headings.

Heading Code	EXPENDITURE AND REVENUE HEADINGS
000	LABOUR COSTS
020	Salaries & Wages (Gross)
030	Superannuation (Employer Liability)
040	N.H.I. & G.P. (Employer Liability)
100	TRAVEL & SUBSISTENCE
110	U.K.
120	Overseas
200	PURCHASE OF BOOKS & PERIODICALS
210	Purchase Grant
220	Other Purchases of Books & Periodicals
300	BINDING (OF LIBRARY STOCK)
310	Internal Binding
320	Outside Binding Work
400	RUNNING EXPENSES
410	Printing & Binding of Publications
411	Internal Printing and Binding of Publications
412	Outside Printing and Binding of Publications

420	Computer Charges
421	Computer Time
422	Computer Videocomp
423	Computer Photon
424	Computer Linotron
430	Stationery & consumable supplies
440	Postage, Telephones & Telex
450	Advertising and Exhibitions
460	Distribution Charges Attributable to Publications Sold
470	Stock Valuation of Publications Sold
480	V.A.T.
490	Repairs & Maintenance - Furniture & Fittings
510	Repairs & Maintenance - Plant & Equipment (including hire charges)
520	Depreciation - Furniture & Fittings
530	Depreciation - Plant & Equipment
540	Other Running Expenses
541	Bank Charges
542	Audit Fees
543	Other Professional Fees
544	Staff Training
545	Other Running Expenses
600	ACCOMMODATION COSTS
610	Rent & Rates
620	Heating, Lighting & Power
630	Insurance
640	Repairs & Maintenance of Accommodation
641	Repairs & Maintenance of Buildings
642	Cleaning
643	Security
650	Amortisation of Buildings
700	RESEARCH AND DEVELOPMENT
710	Consultancy and Contract Work
720	Internal R & D Projects

800	CAPITAL EXPENDITURE
810	Buildings
820	Furniture & Fittings
830	Plant & Equipment
900	REVENUE
910	Annual Grant
920	Subscriptions
930	Sales & Services
940	Recoveries
950	Other Income

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From time to time papers in Program include useful cost data.